Title: BRANCHED ALKYL-AROMATIC SULFONIC ACID DISPERSANTS FOR DISPERSING

ASPHALTENES IN PETROLEUM OILS

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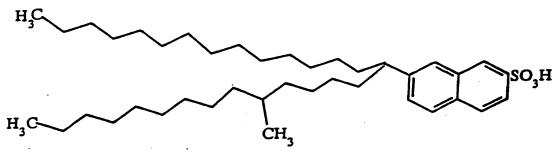


Figure 1. Structure of Iso-C15-C15 Naphthalene Sulfonic Acid

$$R+Q \geq 29$$
 where R & Q are alkyl chains with at least one branched methyl or longer alkyl group for every 20 carbons

Figure 2. Preferred Asphaltene Dispersant Structure